

Rationale for Use and Reporting of Estimated GFR

Use of an estimating or prediction equation to estimate glomerular filtration rate (GFR) from serum creatinine should be employed for people with chronic kidney disease (CKD) and those at risk for CKD (diabetes, hypertension, cardiovascular disease, and family history of kidney disease).

This is a recommendation of the National Kidney Disease Education Program (NKDEP) of the National Institutes of Health (NIH) and the Kidney Disease Outcomes Quality Initiative (KDOQI) of the National Kidney Foundation. This method is also referenced for definition of CKD in the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) of the NIH. All recommend the MDRD equation for adults. NKDEP and KDOQI advocate that laboratories routinely report estimated GFR along with serum creatinine. Several health systems have begun this practice.

The primary reasons for these recommendations are:

- **GFR and creatinine clearance are poorly inferred from serum creatinine alone.** This is mainly because these are related inversely (non-linearly) to serum creatinine. The effects of age and gender, and to a lesser extent race, on creatinine production further cloud interpretation.
- **Creatinine is more often measured than urinary albumin.** For patients with diabetic nephropathy, increased urinary albumin excretion often occurs before decreases in GFR. However, adherence to guidelines for annual testing is poor. Serum creatinine is measured frequently and may be the initial screening test for CKD.
- **Measurement of kidney function (GFR or creatinine clearance) is essential once albuminuria is discovered.**
- **The MDRD equation is the most thoroughly validated equation.** Further validation is under way in additional populations, for example in people with normal GFR, people with diabetes, and Hispanics.
- **The MDRD equation is superior to other methods of approximating GFR.** Direct comparison of the MDRD equation to other equations such as Cockcroft-Gault and even 24-hour urine collections have proven this superiority.
- **The normal serum creatinine reference interval does not necessarily reflect a normal GFR for an individual patient.** Primary care providers and other specialists should routinely use an estimating equation to assess patients' kidney function.
- **The MDRD equation does not require weight or height variables.** The equation yields a GFR result normalized to 1.73 m^2 body surface area, which is an accepted average adult body surface area. The equation does require race (African American or non-African American), yet not all laboratory systems collect this data. A general recommendation is to report estimated GFR values for both African Americans and non-African Americans. (The difference between the two estimates is typically about 20%) The patient or provider can decide which is appropriate.

GFR calculators are available at www.nkdep.nih.gov.

Routine reporting of estimated GFR along with serum creatinine is highly desirable. For more information and other resources, please visit the Laboratory Professionals section of the NKDEP website at www.nkdep.nih.gov/labprofessionals.



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